

SIMPLIFIED LESSONS ON PROPER CARE OF AUTOS

Professor Guerrich Explains Advantages of the T and L-Head Types of Motors.

VALVE IN HEAD TYPE SHOWN

Numerous Questions From Owners Relative to Engine Trouble Explained in Detail—Every Owner Should Learn to Grind Valves.

LESSON NO. 25.
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Before taking up the magneto and starting and lighting system, there are a few questions which I wish to answer as they are interesting.

Question from A. J. B.—The motor in my Buick car does not have the valves placed in those shown in the engine in your first lesson. They call my engine a valve-in-the-head engine. Could you explain its action to me?

Question from E. B. P.—My engine has not got valves on both sides; they are all on one side. Is the action the same as the engine you showed?

Answer.—For convenience, when I explained the cycle and valve action of the engine, I used what is known as a T-head motor, that is, one in which the valves are placed on opposite sides of the cylinder. Figure 1 in the drawing shows this motor, and you will notice that it really forms the letter T from which it gets its name.

In addition to the T-head motor engines are also built in the form of the L-head and also of the valve-in-the-head, or as it is often called, overhead-valve motor. Then there are special types, such as the Knight sleeve valve and the rotary valve motor.

The L-head motor, shown in Figure 2, differs from the T-head motor only in the arrangement of the valves. In this motor the valves are all placed on the one side, the action otherwise being exactly the same as that of the T-head motor. Of course, in the T-head motor, the fresh gases enter on one side and the exhaust gases go out on the other side, while in the L-head, the gases enter on the front or rear portion and exhaust on the rear or front portion of the cylinder, respectively, but on the same side.

In most L-type engines the valves are arranged thus: No. 1 will have the exhaust in forward portion, and intake No. 2, the inlet forward and exhaust rear. No. 3, exhaust forward, inlet rear. No. 4, inlet front, exhaust rear. The reason for this is that it will permit the inlet manifold to be built with only two branches of the four-cylinder engine and three branches for the six-cylinder engine.

T and L-Head Motors.
Both the T and L-head motors have their advantages and disadvantages. The T-head motor can have larger valves, and these valves are usually more accessible. It is, however, more expensive to build, and has more parts, as it will have to have two cam shafts and two helical gears. It is, naturally, a heavy motor.

The L-head will require only one cam shaft and gear, and has the added advantage of having the inlet manifold near the inlet manifold, so that the heat of the exhaust will tend to heat the inlet manifold, and so help prevent the condensation of the gas in the mixture. The size of the valves, however, is limited, and are liable to be less accessible.

The overhead-valve engine has the valves placed on top of the head of the cylinder. In both the T and L-head motors the valves are opened by being pushed up against the spring, but in the overhead engine they are opened by being pushed down. The cam shaft is the same, but between the valve lifter and the valve a push rod and rocker arm are placed.

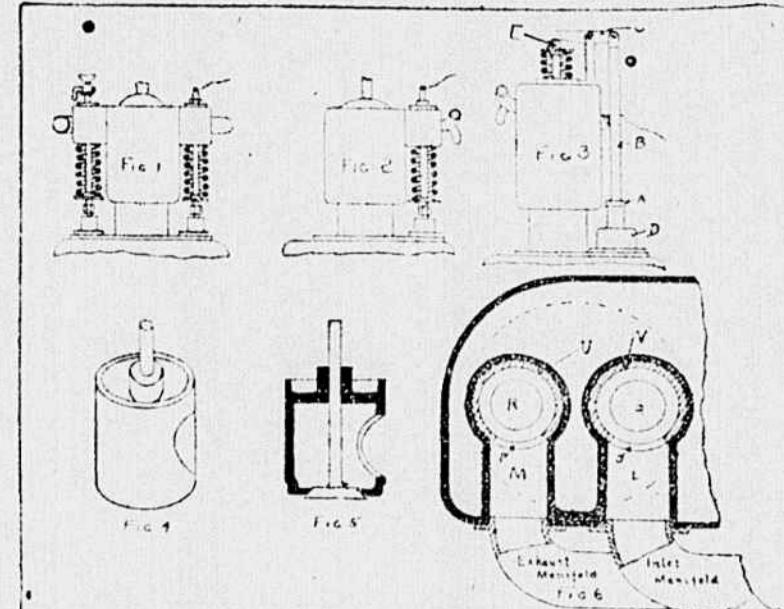
Figure 3 shows the overhead, or valve-in-the-head, motor. D is the valve-lifter guide. A the valve lifter. These parts you will notice are the same in the T and L-head motors, and it is the push rod, which rests in a hollow on the valve lifter, while C is the rocker arm, and E the valve stem.

You will note that as A is raised, it is also raised, and that, because of the rocker-arm action, the valve stem is therefore, valve is pushed down, and so the valve is opened.

In most overhead-valve engines the valve is contained in a valve cage, as is shown in Figures 4 and 5. This valve cage is simply a cast-iron cylinder having a hole in the side, and one in the bottom, which is closed by the valve. These valve cages fit snugly in holes bored in the head of the cylinders, each cylinder having an inlet valve and cage and an exhaust valve and cage.

By referring to Figure 6, you will note that this represents a cross section of the head of a single cylinder. The hatched (lined) rings U and

Diagram of a T Head Motor



COME SOUTH. YOUNG MAN: SPLENDID OPPORTUNITY

The Advice of S. Davies Warfield, One of Best Business Men of the Country.

S. Davies Warfield, chairman of the board of directors of the Seaboard Air Line Railway, president of the Central Trust Company of Baltimore, and one of the most far-sighted business men of the country, recently advised that fifty years ago George Washington offered to ambitious young business men an opportunity to come South. He says the South is the place for the young man interested in agriculture, in industrial development, or in any other kind of young man, and has the plan, "Why not another decade? This is the advice I give to my close friends. It is in the advice that I have followed myself."

That is sound advice, as those who have already anticipated Mr. Warfield by acting as he now suggests will testify. It may be said that the young man who decides to heed the admonition need not go any further than

Virginia. "The South offers to-day the greatest opportunities to come South. He says the South is the place for the young man interested in agriculture, in industrial development, or in any other kind of young man, and has the plan, "Why not another decade? This is the advice I give to my close friends. It is in the advice that I have followed myself."

First—Get a new set of gaskets to put under the valve caps, also some grinding compound, such as for example, clover leaf or Old Dutch, and a valve-spring lifter.

Second—Remove spark plugs, compression rocks and valve caps.

Third—Scrape the carbon off one of the valves and note if it is numbered. If not, number the valves by marking center-punch marks on them.

Fourth—Remove the valves as follows: With the valve-spring lifter press up the spring. As you do this the valve will probably also rise, if not, raise it with a screwdriver. Insert a fine wire under the valve head. Force down the valve and remove the key. Let down the spring and remove the valve-spring tool. With the wire pull out the valve. Remove the spring. If you do the above, as given, you will find it comparatively easy, otherwise you may find getting the valve out a tedious task.

Fifth—Clean the carbon off all of the valves, but do not touch the valve seats. (The valve seat is the portion against which the valve rests in the cylinder.)

Sixth—Put a very thin coat of the compound on the valve, replace it and with a screwdriver revolve the valve back and forth, raising it and giving it a half-turn about every tenth oscillation. Periodically remove the valve and see if the little holes (pits) have disappeared. When they have disappeared or a fine bright ring appears, the valve is properly ground.

Seventh—Reassemble the parts.

Hints—Always, when assembling, put a little graphite on threaded parts subject to heat, so as to keep the threads from fusing together.

A mixture of graphite and brown shellac placed on the threads of the valve caps will help to make them tight, but this must not be put on the spark-plug threads.

After grinding, the valves will usually require to be readjusted.

When grinding or adjusting be sure that the valve-lifter is fully down and not resting on any portion of the offset of the cam. If so, revolve the shaft by cranking a half-turn.

The valve adjusting should be checked up when the engine is hot, as the expansion may result in the valve not seating properly.

undevloped natural assets of this country.

It has been well said that the development of the South means the encouragement of the pioneer spirit, because the South is a big one. There are over twenty million people occupied on crudely tilled farm lands in the South awaiting the intelligent and hardy pioneer. This means nearly 70,000 farms of ten acres each.

There is a constructive program

of breeding purposes, in not fat, and could easily take on 200 pounds more or flesh. The measurements are length 70 inches between the ears to Philadelphia, and the probability is around heart 81 inches girth standing on a strong, 11-legged horse.

WORK ON WATER FRONT
Norfolk and Western Rushing Things at Lambert's Point, Preparing for Immense Future Business.

NORFOLK, VA., February 10.— Activities of the Norfolk and Western Railway in the Lambert's Point section all along that water front. The place is now a perfect harbor, and when the work is done it will be a place of strenuous endeavor of both day and night.

The erection between the Lambert's point coal piers and the city of Norfolk of two immense warehouses indicates the yearly handling of an enormous volume of business by land and water.

The steel framework of these warehouses is rapidly going up, and the piers in front of them are about complete. In addition to the Norfolk and Western will spend a large sum in the improvement of its coal piers to take care of its great and growing export trade.

Millions of tons of coal are coming down from the mines every year, borne by long trains drawn by great engines, and they are flowing a black stream into the holds of waiting vessels to be conveyed to all parts of the world.

By a process of filling in many acres of land near Lambert's Point have been made available for use, and the Norfolk and Western is now covering it with a network of tracks in order to be ready to haul the traffic when the warehouses are complete.

Philadelphia and Williamsburg.
WILLIAMSBURG, VA., February 10.— Philadelphia money combines with local capital to advance the industrial interests of Williamsburg. The Boazart Timber Corporation, incorporated here with \$100,000 capital stock, is such an industry. W. H. Sharp, of Philadelphia, is the president of this company. W. A. Boazart, of this city,

and N. E. Tausek, secretary-treasurer. The new company will develop extensive coal lands in this country.

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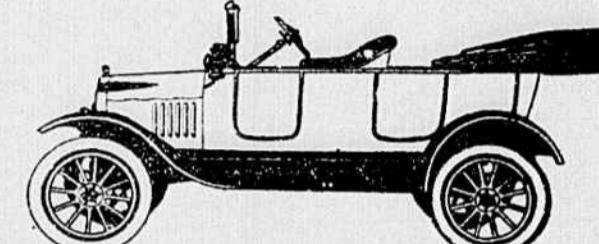
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